

AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims

Claims 1 – 10 (Canceled)

11. (Currently Amended) A molecular cluster beam apparatus, comprising:
vaporization means for vaporizing or atomizing a metal cluster complex;
ionization means for ionizing the vaporized or atomized metal cluster complex;
acceleration means for accelerating the ionized metal cluster complex;
convergence means for converging an orbit of a beam of the metal cluster complex
accelerated, ~~by making the orbit to be curved by the acceleration means~~; and
scanning means for scanning with the beam of the metal cluster complex accelerated and
converged, toward a substrate, by making the orbit of the beam to be curved.

12. (New) A cluster beam apparatus, comprising:

a first conduit;
a vaporizing mechanism housed in the first conduit;
a metal cluster complex in the vaporizing mechanism as a vaporization material source;
a second conduit crossing the first conduit; and

an ionization chamber at the crossing of the first and second conduits, wherein
the vaporizing mechanism vaporizes the metal cluster complex and discharges the
vaporized metal cluster complex into the first conduit,
the ionization chamber receives the vaporized metal cluster complex, and
the received vaporized metal cluster complex is ionized in the ionization chamber.

13. (New) A cluster beam apparatus, comprising:

means for vaporizing or atomizing a metal cluster complex; and
means for ionizing the one of vaporized or atomized metal cluster complex.

14. (New) The cluster beam apparatus as claimed in claim 13, wherein the means for
ionizing uses electron impact for ionizing.

15. (New) The cluster beam apparatus as claimed in claim 13, wherein the means for
ionizing uses light irradiation for ionizing.

16. (New) The cluster beam apparatus as claimed in claim 13, wherein the means for
ionizing uses plasma for ionizing.

17. (New) The cluster beam apparatus as claimed in claim 13, wherein the means for
ionizing uses an electric field for ionizing.

18. (New) The cluster beam apparatus as claimed in claim 13, wherein the means for ionizing the one of vaporized or atomized metal cluster complex uses electric charge exchange of highly-excited electrons for ionizing.

19. (New) The cluster beam apparatus as claimed in any one of claims 13 to 18, wherein the metal cluster complex is dissolved in a solvent and generated as a mist in the means for vaporizing or atomizing a metal cluster complex; and the means for ionizing gives an electric charge to the mist of the metal cluster complex.

20. (New) A cluster beam apparatus, comprising:
means for generating energy; and
means for irradiating a metal cluster complex with the generated energy to simultaneously vaporize and ionize the metal cluster complex.

21. (New) The cluster beam apparatus as claimed in claimed 20, wherein the means for generating energy includes means for causing laser ablation.

22. (New) A cluster beam apparatus, comprising:
a first conduit;
a vaporizing mechanism housed in the first conduit,
a highly-excited-electron-generation source material in the vaporizing mechanism;
a second conduit crossing the first conduit;

an atomizing mechanism housed in the second conduit;
a metal cluster complex in the atomizing mechanism as a mist material source; and
an ionization chamber at the crossing of the first and second conduits, wherein
the vaporizing mechanism vaporizes the highly-excited-electron-generation source
material and discharges the vapor into the first conduit,
the atomized mechanism atomizes the metal cluster complex and discharges a mist of
metal cluster complex into the second conduit, and
the ionization chamber receives the vaporized highly-excited-electron-generation source
material and the mist of the metal cluster complex and outputs ionized multi-nuclear metal
molecules.

23. (New) The cluster beam apparatus as claimed in claim 11, wherein the apparatus
generates a cluster ion beam with uniform cluster size.

24. (New) The cluster beam apparatus as claimed in claim 12, wherein the apparatus
generates a cluster ion beam with uniform cluster size.

25. (New) The cluster beam apparatus as claimed in claim 13, wherein the apparatus
generates a cluster ion beam with uniform cluster size.

26. (New) The cluster beam apparatus as claimed in claim 20, wherein the apparatus
generates a cluster ion beam with uniform cluster size.

27. (New) The cluster beam apparatus as claimed in claim 21, wherein the apparatus generates a cluster ion beam with uniform cluster size.